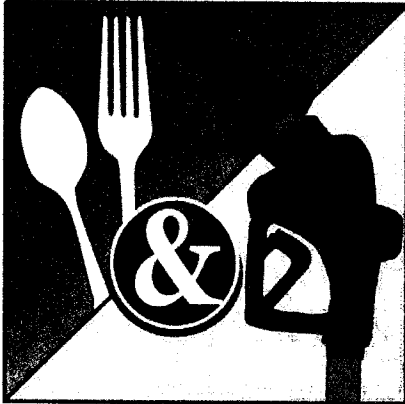


## U.S. CORN GROWERS: PRODUCING FOOD AND FUEL



With more than 100 operating biorefineries and dozens more under construction, the U.S. ethanol industry is booming. These biorefineries will add approximately 5 billion gallons of domestically produced, renewable fuel to the U.S. gasoline supply in 2006.

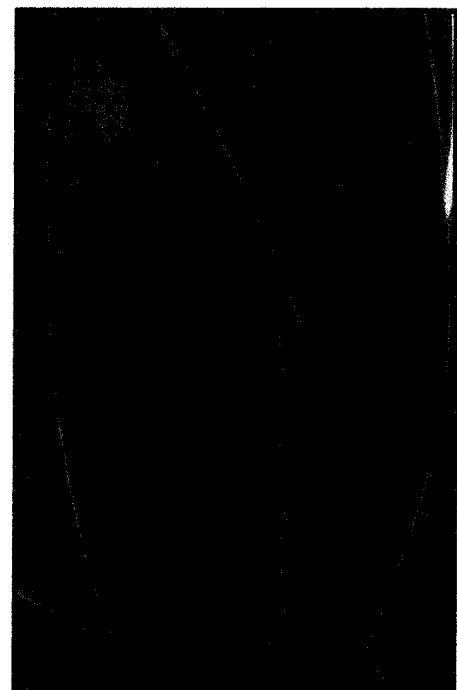
As a result of rapid production capacity expansion, the amount of corn used for ethanol production is increasing dramatically. In fact, corn use for ethanol more than doubled between 2001 and 2005.

Accelerated growth in corn use for ethanol has led critics to question the industry's ability to satisfy demand for both renewable fuels and traditional uses like livestock and poultry feed, food processing and exports. Skeptics suggest the corn industry will face difficulty in meeting demand and growers will experience a dilemma of whether to supply customers in the feed, food and export markets or to supply the burgeoning ethanol industry. This contrived "food versus fuel" argument is fraught with misguided logic, deception and scare tactics.

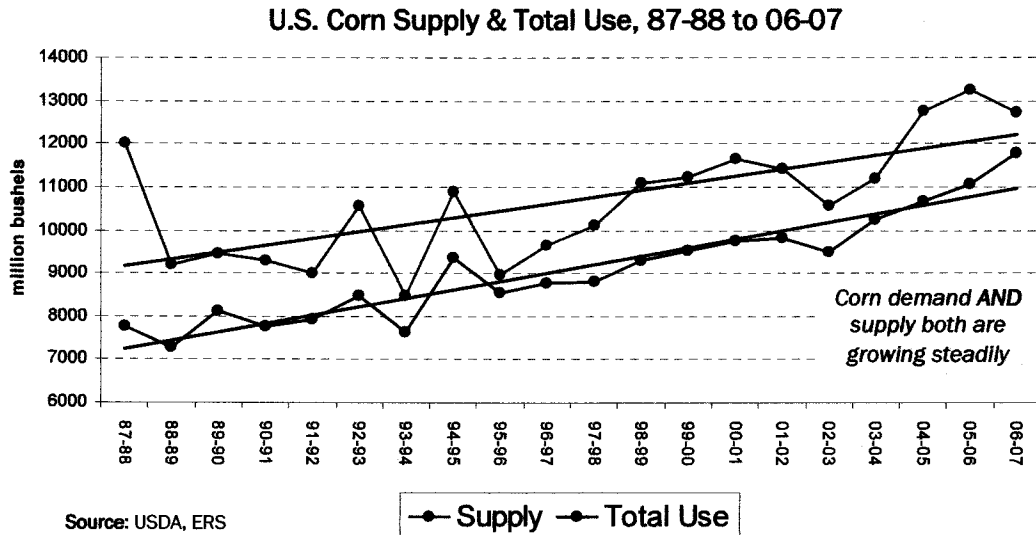
Detractors argue that grain markets should adhere to a hierarchical approach that emphasizes grain's utility as food and feed. But what about the fundamental human needs of energy, security and mobility? Aren't those needs interconnected with the basic need of nourishment? And if the U.S. agriculture sector has the technology and ingenuity to impact all of those needs, shouldn't it aspire to do so?

As opposed to ranking the demands on grain, a comprehensive view of agriculture's role in meeting the essential needs of tomorrow should be considered. The corn industry will continue to strive to satisfy a variety of important demands and maximize the utility of its product. Seed technology developments, increasing agricultural efficiency, innovation in renewable fuels production processes and other breakthroughs will ensure that the American farmer will continue to meet the world's needs for food, feed, fuel and other uses.

This paper examines the most common myths that the "food versus fuel" fallacy is built upon and provides accurate information to refute the notion that corn growers will face an "either-or" dilemma when marketing their grain. As they have done for decades, U.S. corn growers will continue to be reliable suppliers of both **food AND fuel**.

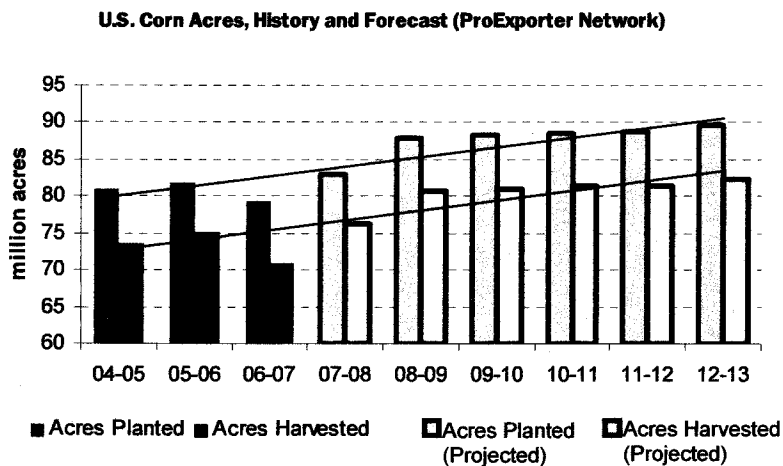


**MYTH:** Increasing ethanol production causes a long-term corn supply-demand imbalance.  
**FACT:** Increasing demand for corn is being met with increasing supply.



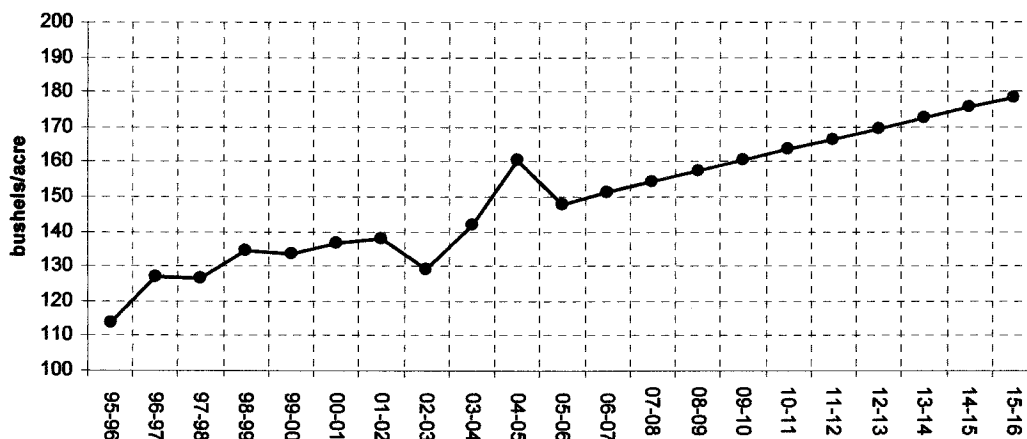
In response to heightened demand, U.S. growers have produced the three largest corn crops in history in the past three years. In 2004, farmers crested the 11 billion bushel mark for the first time ever, harvesting a record 11.8 billion bushel crop. The record harvest of 2004 was followed by an 11.1 billion bushel crop in 2005. After all demands were met, the corn industry finished 2005 with nearly 2 billion bushels in surplus—one of the highest levels since the 1980s. This surplus provides a “cushion” for the corn industry in the event of a short crop or spike in demand. Despite moderate drought conditions in many parts of the country, the U.S. Department of Agriculture is estimating the 2006 corn crop at 10.75 billion bushels, marking the third-largest crop ever. Simply put, though the market may experience more volatility as demand rapidly increases, there is **no shortage of corn**.

Corn growers make their planting decisions based on signals from the marketplace. If demand for corn is high and projected revenue-per-acre is strong relative to other crops, farmers will plant more corn. It is also possible that some portion of the 35 million acres currently enrolled in the Conservation Reserve Program (CRP) may come back into production upon expiration of those CRP contracts. According to some estimates, increased demand for corn is expected to encourage farmers to plant as much as 87 to 90 million acres to corn in the future.



Furthermore, increasing corn yields will ensure there continues to be an adequate supply of corn for all markets in the future. On average, corn yields have increased by about 3.5 bushels per acre per year since the 1995-1996 crop year. Based on the 10-year historical trend, corn yield per acre could reach 180 bushels by 2015. Corn yields could advance at an even faster rate than indicated by the 10-year trend because of improved plant breeding practices and biotechnology.

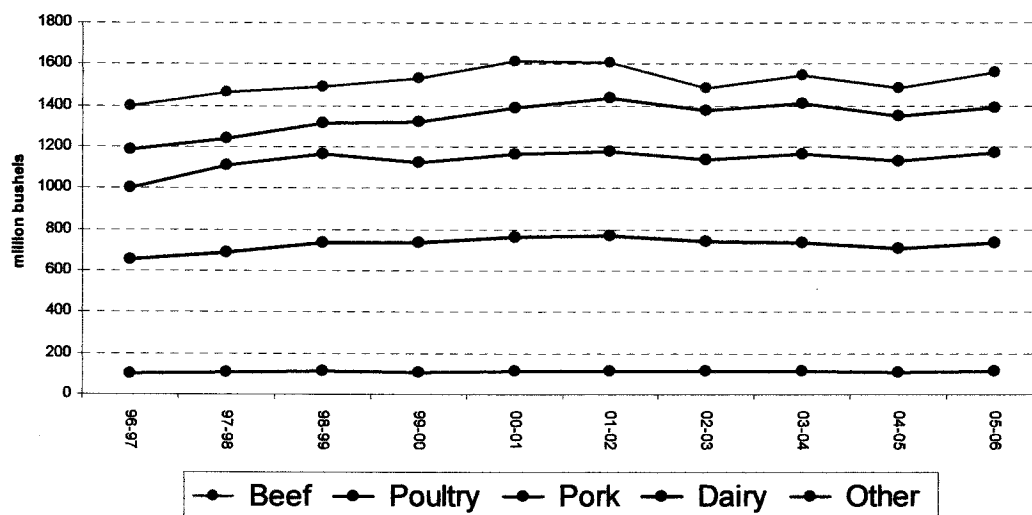
**Corn Yield**



Source: Historical yields = USDA, ERS; Future Trend = NCGA

Additionally, because other corn demand categories show signs of only limited future growth, it is expected that most of the additional supply resulting from higher yields will be available for biofuels production. The chart below indicates that demand for corn in the livestock sector has been relatively flat in the last 10 marketing years. Similarly, the amount of corn used for non-ethanol industrial processing has been flat, and corn exports have trended up only slightly.

**Feed Use, by Animal Group**



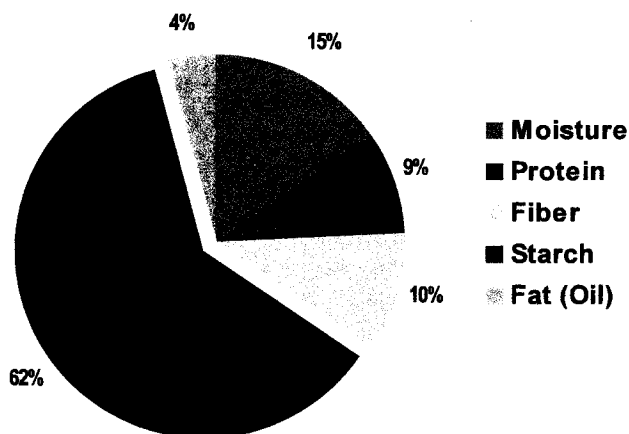
Source: USDA, ERS

**MYTH:** Ethanol production diverts corn away from food and feed markets.

**FACT:** There will be plenty of corn available. And in addition to fuel, the ethanol process creates livestock feed and food products.

Every 56-pound bushel of corn used in the dry grind ethanol process yields 18 pounds of distillers grains, a good source of **energy** and **protein** for livestock and poultry. Similarly, a bushel of corn in the wet mill ethanol process creates 13.5 pounds of corn gluten feed and 2.6 pounds of high-protein corn gluten meal, as well as corn oil used in food processing.

**Components of Yellow Dent Corn**



Wet Weight

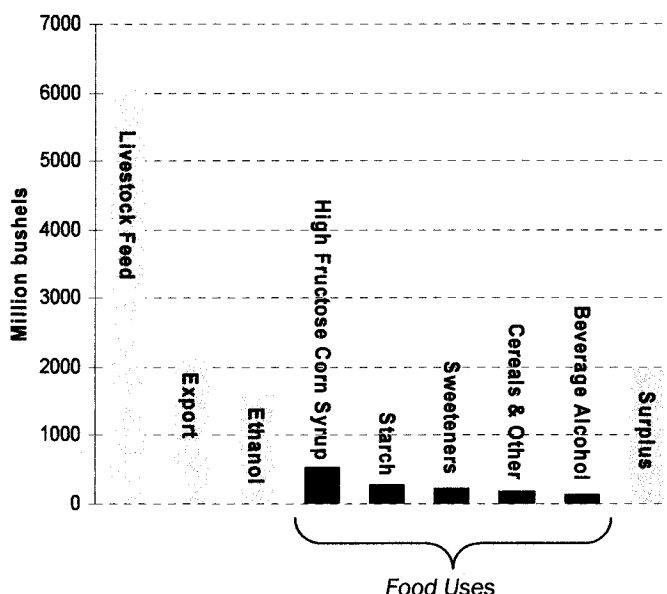
Source: Corn Chemistry and Technology

The ethanol process removes only starch—not protein—from the feed and food market. The starch portion of the kernel is converted to ethanol, while the protein, fat and other nutrients are passed through to the feed coproducts or human food ingredients. Protein, which is left intact by the ethanol process, is a highly valued product in world food and feed markets. Conversely, starch is abundantly available and lower in value. Aside from preserving the protein, a considerable portion of the corn's original digestible energy is also preserved in the distillers grains.

The distillers grains made through the conventional dry grind ethanol process have an average protein content (28 to 30 percent) that is typically at least three times higher than that of corn, making it a valuable ingredient in livestock and poultry diets.

It also is important to remember the amount of field corn actually used for human food is just a small fraction of the total corn supply. For example, cereal accounted for more than **one percent of total corn use** in 2005. The overwhelming majority of U.S. corn, including exported corn, feeds livestock—not humans.

**05/06 Corn Use**



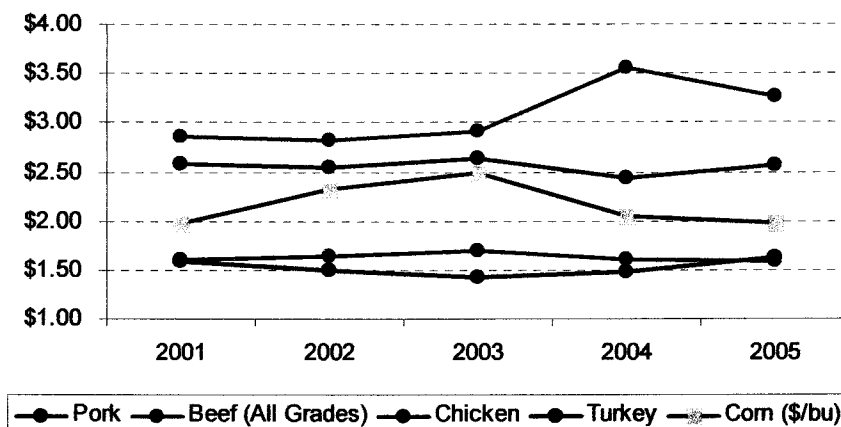
Source: USDA October WASDE; and USDA-ERS Feed Grains Database, OCT 06

**MYTH:** The ethanol industry's demand for corn causes consumer food prices to rise.

**FACT:** Corn demand for ethanol has no noticeable impact on food prices.

Concerns about the ethanol sector's increased demand for corn and the impact on meat prices are nothing new. A 1995 *Chicago Tribune* piece claimed using corn for ethanol would raise the price of corn to such an extent that consumer meat prices would rise drastically. The article claimed "...the conversion of corn into ethanol would destroy our meat industry..." But more than 10 years after the article was published, U.S. consumers continue to enjoy the most **affordable and abundant** food supply in the world. Despite a surge in ethanol demand for corn between 2001 and 2005, average corn prices did not increase significantly. And history shows us that farm-gate corn prices and retail meat prices are decoupled. The chart below shows that in the past five years, there has not been any correlation between average farm-gate corn prices and retail meat prices.

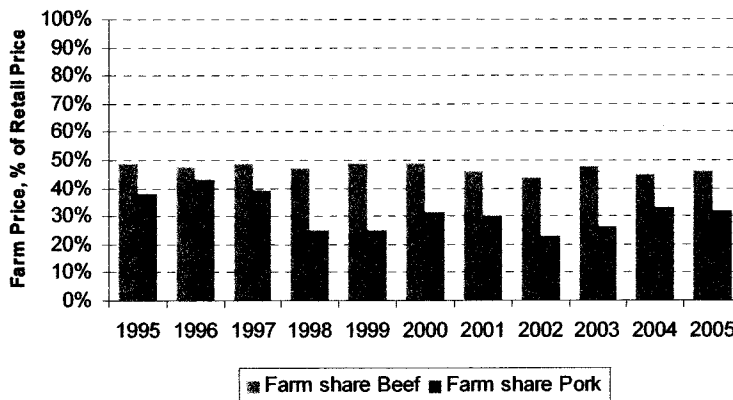
**Retail Meat Prices and Corn Price**  
Feature-weighted average price (\$/lb.)  
Meat prices=\$/lb.; Corn price=\$/bu.



Source: USDA Livestock Marketing Information Center, Retail Scanner Prices for Meat

It is also revealing to look at the farm-gate prices for meat in comparison to retail prices. The chart below depicts the share of the retail price that a farmer receives for livestock. Using farm share as a proxy for retail price sensitivity to increased feed prices, it would be difficult to argue that marginally rising grain prices will drive up the price a consumer pays for pork chops, steaks, or other retail meat products. In recent years, the farm-gate price of a pig has represented only about 30 percent of the value of pork in the grocery store, while farm-gate cattle prices have been about 45 percent of the retail value.

**Farm Price v. Retail Price, Pork & Beef**



Source: USDA, ERS

**MYTH:** Ethanol production will reduce the availability of affordable corn for livestock.

**FACT:** Larger supplies of corn will ensure continued availability of affordable corn.

As the ethanol industry continues to rapidly increase its consumption of corn, many analysts suggest the corn market will experience increased price volatility. Indeed, as an example, the Central Illinois cash corn price rose from \$2.36 per bushel the week of July 15, 2006, to \$3.18 per bushel the week of Nov. 4, 2006, on the speculation of increased demand from the ethanol sector. However, a look at historical corn prices indicates **current price levels are not unprecedented** or unmanageable. To put recent corn prices in perspective, consider that farm-gate yearly corn price averages topped \$3.10 three times in the past 25 years. Three separate three-year periods are detailed in the table at left and compared to the current three-year period to put recent corn prices in proper historical context.

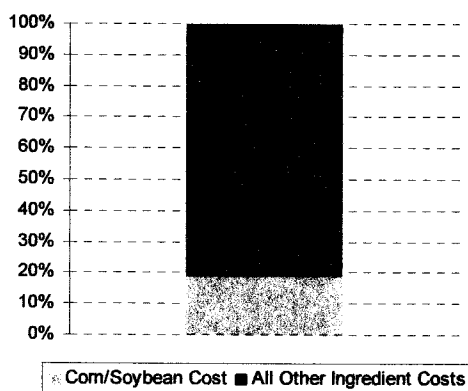
Crop Year	Avg. Farm Price (\$/bu)
79-80	\$2.48
80-81	\$3.13
81-82	\$2.47
<b>3-year avg.</b>	<b>\$2.69</b>
82-83	\$2.64
83-84	\$3.23
84-85	\$2.64
<b>3-year avg.</b>	<b>\$2.84</b>
95-96	\$3.53
96-97	\$2.74
97-98	\$2.41
<b>3-year avg.</b>	<b>\$2.89</b>
04-05	\$2.05
05-06	\$2.03
06-07	\$3.00*
<b>3-year avg.</b>	<b>\$2.36</b>

Source: USDA, ERS & NOV06 WASDE  
\*USDA mid-point price estimate, NOV06

It is also important to note that corn is often only one of many inputs in livestock and poultry production and represents **only a portion of total production costs**. As an example, the lower right chart demonstrates that in 2004 feed grains accounted for less than 10 percent of the total input costs for every 100 pounds of gain on a feeder pig. It is often reported that grain is the largest cost of feeding hogs. However, as the chart obviously shows, the single largest cost in a hog-finishing operation is the feeder pig itself.

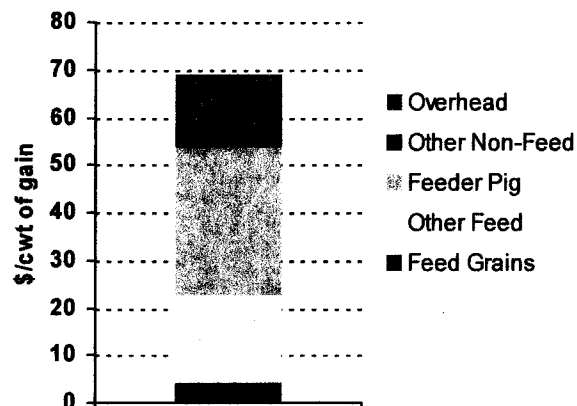
According to data from The Hale Group, corn is of less importance relative to other ingredients when considering the total ingredient costs in the price of commodity chicken (see lower left chart). Corn and soybean ingredients combined account for less than 20 percent of the total ingredient costs for commodity chicken. All other ingredients account for slightly more than 80 percent of the total ingredient costs.

**Importance of Corn & Soybean Ingredients as Percentage of Total Ingredient Costs for Commodity Chicken**



Source: Adapted from The Hale Group

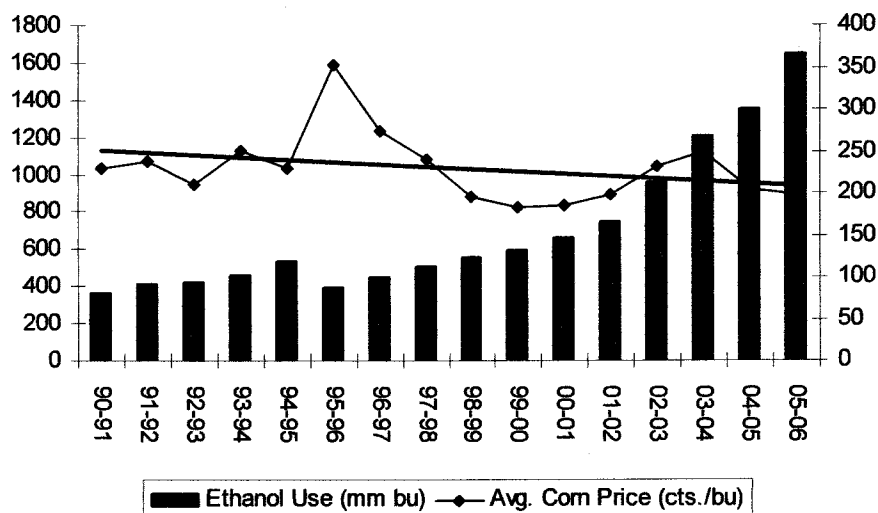
**2004 Feeder Pig to Finish Production Costs**



Source: USDA, ERS, Agricultural Resource Management Survey

Despite the recent uptick in corn prices, increased ethanol production in the past 15 years has not caused a sustained increase in the farm-gate price of corn above historical levels. The chart below shows farm-gate corn prices have actually **trended down** since the early 1990s—even in the face of increasing corn demand for ethanol.

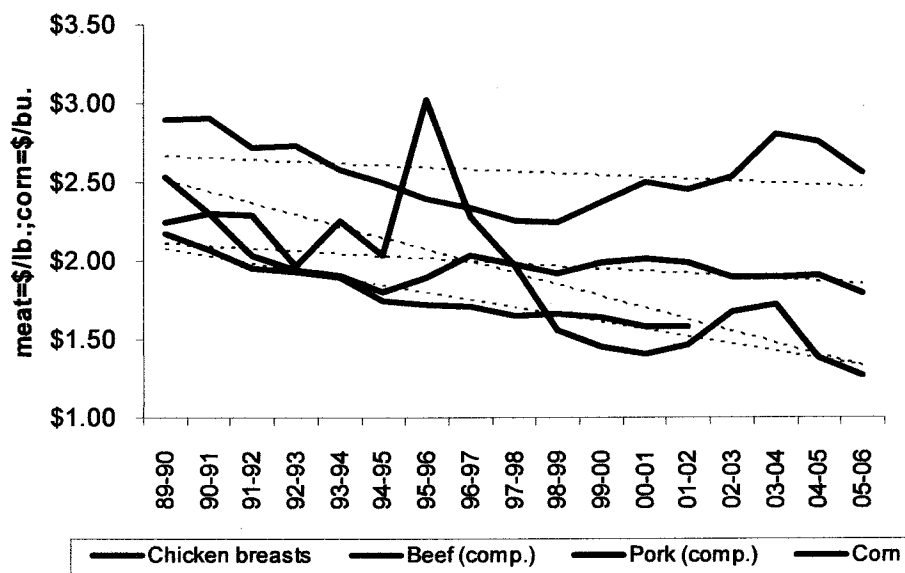
**Corn Price Relative to Ethanol Use**



Source: USDA, ERS

The downward trend in corn prices is even more pronounced when inflation is considered. The chart below shows inflation-adjusted prices (1990=100) for corn in relation to inflation-adjusted prices for beef, pork and chicken breasts. In all cases, the trend rate of decline of inflation-adjusted corn prices is sharper than declines in meat prices.

**U.S. Average Corn Price vs. Retail Meat Values,  
Inflation-Adjusted (1990=100)**



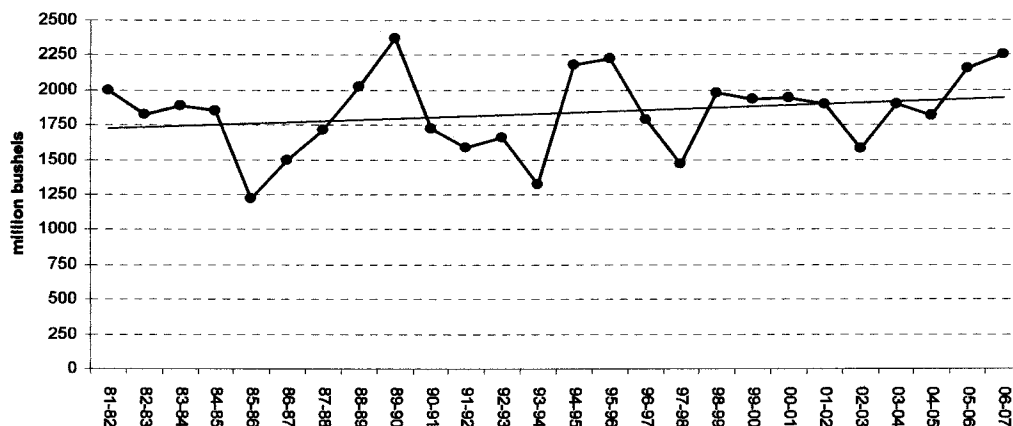
Source: USDA, ERS

**MYTH:** Ethanol production cuts U.S. food exports to undernourished countries.

**FACT:** Increased production will allow corn growers to satisfy both domestic and export demand. And the majority of exports feed livestock—not humans.

Even as corn use for ethanol has risen dramatically in the past 25 years, American farmers have continued to easily meet all demands for U.S. corn from foreign customers. U.S. corn growers continue to serve proudly as the **world's top exporter of corn**. The ethanol sector is also helping to satisfy foreign demand for high-protein, high-energy feedstuffs by **exporting large amounts of distillers grains** annually. The United States exported more than 1 million metric tons of distillers grains to countries around the world in 2005. As the chart below clearly shows, increased demand for corn in the ethanol sector has not caused a downturn in exports.

**U.S. Corn Exports**



Source: USDA, ERS

In the emotion of the “food vs. fuel” issue, there is a popular misconception that U.S. corn exports are used to feed humans in malnourished countries across the globe and that ethanol use will diminish exports to these countries. The truth is the majority of corn exports from the United States are **used to feed livestock** in developed countries.

Another fact that is often lost in this debate is that there is more food per capita today on a global scale than ever before, according to the Food and Agriculture Organization of the United Nations. Lack of infrastructure, access to capital, and other issues are the more likely causes of hunger—not scarcity of food.

**For more information, contact:**  
National Corn Growers Association  
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